AMENDMENTS TO THE CLAIMS

This listing of claims replaces all previous versions and listings of claims:

1. (Original) An insulin-producing cell derived from a neural or neuroendocrine stem cell.

2. (Original) The insulin-producing cell of claim 1, wherein the neural or neuroendocrine stem cell is a cell from a neural or neuroendocrine stem cell line.

3. (Original) The insulin-producing cell of claim 1, wherein the insulin-producing cell is positive for one or more markers selected from the group consisting of: insulin C-peptide and glucokinase.

4. (Original) The insulin-producing cell of claim 1, wherein the insulin-producing cell does not produce glucagon, pancreatic polypeptide or somatostatin.

5. (Original) The insulin-producing cell of claim 1, wherein the insulin-producing cell is not apoptotic.

6. (Original) A cell cluster derived from neural or neuroendocrine stem cells, wherein the cell cluster comprises insulin-producing cells.

7. (Original) The cell cluster of claim 6, wherein at least 50% of the cells of the cell cluster comprise cytoplasmic insulin.

8. (Original) The cell cluster of claim 6, wherein the cell cluster further comprises at least one cell type selected from the group consisting of: glucagon producing cells, pancreatic polypeptide producing cells and somatostatin producing cells.

9. (Original) The cell cluster of claim 6, wherein at least 50% of the cells of the cell cluster are viable.

10. (Original) A method for making a cell composition comprising cells that are receptive to treatment with an islet cell differentiation factor, the method comprising culturing stem cells with a neural/endoderm caudalizing factor.

11. (Original) The method of claim 10, wherein the stem cells are neural or neuroendocrine stem cells.

12. (Original) The method of claim 11, wherein the stem cells are cells of a neural or neuroendocrine stem cell line.

13. (Original) The method of claim 10, wherein the cell composition comprises or is derived from a neural stem cell that is positive for binding to a monoclonal antibody AC133 or to a monoclonal antibody 5E12.

14. (Original) The method of claim 10, wherein the neural/endoderm caudalizing factor is caudalizing retinoic acid signaling activator.

15. (Original) The method of claim 14, wherein the caudalizing retinoic acid signaling activator is a retinoid.

16. (Original) The method of claim 14, wherein the neural/endoderm caudalizing factor is an all-trans retinoic acid or an ester, salt or free base thereof.

17. (Cancelled)

18. (Original) A method for producing insulin-producing cells, the method comprising:

a. culturing human stem cells with a neural/endoderm caudalizing factor to obtain a first cell composition;

b. culturing the first cell composition, or a portion thereof, with an islet cell differentiation factor, thereby obtaining a second cell composition comprising insulin-producing cells.

19. (Original) The method of claim 18, wherein the second cell composition additionally comprises one or more of the following cell types: somatostatin producing cells, pancreatic polypeptide producing cells and glucagon producing cells.

20. (Original) A cell composition comprising insulin-producing cells prepared according to the method of claim 18.

21. (Original) The method of claim 18, wherein at least 50% of the cells of the second cell composition are not apoptotic.

22. (Original) The method of claim 18, wherein culturing the first population of cells, or a portion thereof, with an islet cell differentiation factor comprises culturing the cells with nicotinamide.

23. (Original) The method of claim 22, wherein culturing the first population of cells, or a portion thereof, with an islet cell differentiation factor comprises culturing the cells with nicotinamide and an additional factor selected from the group consisting of IGF-1, AN IGF-1 AGONIST, a PI3K inhibitor, butyric acid or a salt thereof, activin, GDF-8, GDF-11 and a hedgehog antagonist.

24.-26. (Cancelled)

27. (Original) A method of ameliorating, in a subject, a condition related to insufficient pancreatic function, the method comprising administering to the subject an effective amount of insulin-producing cells produced according to the method of claim 18.

28. (Original) The method of claim 27, wherein the effective amount of insulin-producing cells causes an increase in blood insulin levels in the subject.

29. (Original) The method of claim 27, wherein the effective amount of insulin-producing cells causes an increased rate of glucose-induced insulin production in the subject.

30. (Original) The method of claim 27, wherein the subject has a diabetes caused by beta-cell insufficiency.

31.-39. (Cancelled)

40. (Currently amended) The method of claim ~~39~~ 18, wherein the neural/endoderm caudalizing factor is selected from the group consisting of: a caudalizing retinoic acid signaling activator, a retinoid, and an all-trans retinoic acid or an ester, salt or free base thereof.

41.-44. (Cancelled)

45. (Original) A method for ameliorating, in a subject, a condition related to insufficient pancreatic function, the method comprising:

a. obtaining from the subject or an HLA-matched donor a sample comprising neural or neuroendocrine stem cells;
b. culturing one or more of the neural or neuroendocrine stem cells in the presence of a neural/endoderm caudalizing factor to obtain a first cell composition;
c. culturing the first cell composition in the presence of an islet cell differentiation factor to obtain a second cell composition, wherein the second cell composition comprises insulin producing cells; and
d. administering to the subject an effective amount of insulin-producing cells.

46. (Original) The method of claim 45, wherein, prior to (b), the sample comprising neural or neuroendocrine stem cells is cultured so as to increase the number of neural or neuroendocrine stem cells.

47. (Original) The method of claim 45, wherein the sample is obtained from a tissue selected from the group consisting of: a tissue comprising cells of the peripheral nervous system, a tissue comprising cells of the central nervous system and a tissue comprising neuroendocrine cells.

48. (Original) The method of claim 45, wherein the sample is obtained by a method selected from among: trans-cranial biopsy, olfactory bulb biopsy, spinal cord biopsy and skin biopsy.

49. (Original) The method of claim 45, wherein the neural/endoderm caudalizing factor is a caudalizing retinoic acid signaling activator.

50. (Original) The method of claim 45, wherein the neural/endoderm caudalizing factor is a retinoid.

51. (Original) The method of claim 45, wherein the neural/endoderm caudalizing factor is is an all-trans retinoic acid or an ester, salt or free base thereof.

52. (Original) The method of claim 45, wherein culturing the first population of cells, or a portion thereof, with an islet cell differentiation factor comprises culturing the cells with nicotinamide.

53. (Original) The method of claim 45, wherein culturing the first population of cells, or a portion thereof, with an islet cell differentiation factor comprises culturing the cells with nicotinamide and an additional factor selected from the group consisting of IGF-1, AN IGF-1 AGONIST, a PI3K inhibitor, butyric acid or a salt thereof, activin, GDF-8, GDF-11 and a hedgehog antagonist.